Parameters for the FOA

- Maximum size of individual project request
  (up to full $10M? lower threshold?)
- Total number of projects to be funded
- Contribution to/collaboration with
  larger offshore/other funding sources OK?
  encouraged?
- R&D for future large project OK?
- Physics topic restriction
- Require physics results within time window
  (5 years? 10 years?)

Double-down on LAr Scenario

SUMMARY

The Office of High Energy Physics (HEP) at the U.S. Department of Energy, Office of Science, hereby invites new grant applications for support of innovative High Energy Physics experiments employing liquid-argon time projection chamber techniques. The experiments would be done under the auspices of the Intensity Frontier and be aimed at investigations of neutrino interactions, measurements of neutrino properties, searches for sterile neutrinos and other exotic neutrino states, or detection of astrophysical neutrino sources. We are seeking in particular small-scale experiments that are scientifically compelling, competitive within the world program, and technically ready so that they can provide results with the next 5-10 years.

SUPPLEMENTARY INFORMATION

The following program descriptions are offered to provide more in-depth information on scientific and technical areas of interest to HEP:
ProgramWebsite: http://science.energy.gov/hep/inp

The mission of the HEP program is to understand how the universe works at its most fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time. The Intensity Frontier uses intense particle beams and highly sensitive detectors to pursue alternate pathways to investigate fundamental forces and particle interactions by studying events that occur rarely in nature, and to provide precision measurements of these phenomena.

The discovery of neutrino mass and mixing has led to a need for a diverse set of experiments to understand the fundamental nature and interactions of neutrinos. The development of liquid argon time projection chambers (LAr-TPCs) has created a great opportunity to study neutrino properties and interactions with unprecedented precision.

Grant applications submitted under this FOA should provide an outline of the science case, the technical readiness of the particular experiment or detector proposed, and a detailed timeline and cost estimate. Experiments that clearly support the US Long Baseline Neutrino Program will be given particular consideration, but all LAr-TPC technologies will be considered. Scientific topics of interest are: How do neutrinos interact with argon nuclei, including resultant hadron multiplicities, final-state interactions, multi-nucleon effects? Are the anomalous appearance results of short-baseline accelerator experiments due to a new, sterile neutrino state? What role will LAr-TPC detectors play in detection of supernova or other astrophysical neutrino sources?

Total funding for this program is anticipated to be $10M, and the Office expects to fund 3-5 individual efforts.

Sterility Scenario

SUMMARY
The Office of High Energy Physics (HEP) at the U.S. Department of Energy, Office of Science, hereby invites new grant applications for support of innovative High Energy Physics experiments aimed at definitively discovering or excluding the existence of sterile neutrinos. The experiments would be done under the auspices of the Intensity Frontier and could be accelerator-based, source-based, or reactor-based measurements. We are seeking in particular small-scale experiments that are scientifically compelling, competitive within the world program, and technically ready so that they can provide results with the next 5-10 years.

SUPPLEMENTARY INFORMATION
The following program descriptions are offered to provide more in-depth information on scientific and technical areas of interest to HEP:
ProgramWebsite: http://science.energy.gov/hep/inp

The mission of the HEP program is to understand how the universe works at its most fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time. The Intensity Frontier uses intense particle beams and highly sensitive detectors to pursue alternate pathways to investigate fundamental forces and particle interactions by studying events that occur rarely in nature, and to provide precision measurements of these phenomena.

The discovery of neutrino mass and mixing has led to a need for a diverse set of experiments to understand the fundamental nature and interactions of neutrinos. Results from source measurements, reactor experiments, and accelerators have included anomalous results that could point to the existence of new, non-interacting neutrino states. Such states, should they exist, would have a dramatic effect on our understanding of the microscopic world.

Grant applications submitted under this FOA should provide an outline of the science case, the technical readiness of the particular experiment or detector proposed, and a detailed timeline and cost estimate.

Total funding for this program is anticipated to be $10M, and the Office expects to fund 3-5 individual efforts.

Interactions Scenario

SUMMARY

The Office of High Energy Physics (HEP) at the U.S. Department of Energy, Office of Science, hereby invites new grant applications for support of innovative High Energy Physics experiments aimed at critical measurements of neutrino interactions with nuclei. The experiments would be done under the auspices of the Intensity Frontier, and would involve accelerator-based measurements spanning energies from 100 MeV to 10 GeV. Experiments that include direct collaboration with the nuclear theory community will be given high priority. We are seeking in particular small-scale experiments that are scientifically compelling, competitive within the world program, and technically ready so that they can provide results with the next 5-10 years.

SUPPLEMENTARY INFORMATION

The following program descriptions are offered to provide more in-depth information on scientific and technical areas of interest to HEP:
ProgramWebsite: http://science.energy.gov/hep/inp

The mission of the HEP program is to understand how the universe works at its most fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time. The Intensity Frontier uses intense particle beams and highly sensitive detectors to pursue alternate pathways to investigate fundamental forces and particle interactions by studying events that occur rarely in nature, and to provide precision measurements of these phenomena.

The discovery of neutrino mass and mixing has led to a need for a diverse set of experiments to understand the fundamental nature and interactions of neutrinos. To go forward, a detailed understanding of how neutrinos interact with nuclei---differential cross sections, multiplicities, final-state interactions and multi-nucleon effects---will be critical. Including such measurements in detailed nuclear and interaction models will maximize their value.

Grant applications submitted under this FOA should provide an outline of the science case, the technical readiness of the particular experiment or detector proposed, and a detailed timeline and cost estimate.

Total funding for this program is anticipated to be $10M, and the Office expects to fund 3-5 individual efforts.

Open Scenario

SUMMARY

The Office of High Energy Physics (HEP) at the U.S. Department of Energy, Office of Science, hereby invites new grant applications for support of innovative experiments in neutrino physics. The experiments would be done under the auspices of the Intensity Frontier and be aimed at investigations of neutrino interactions, measurements of neutrino properties, searches for sterile neutrinos and other exotic neutrino states, or detection of astrophysical neutrino sources. Directed R&D in support of large-scale future experiments that will address these questions may also be funded. We are seeking in particular small-scale experiments that are scientifically compelling, competitive within the world program, and technically ready so that they can provide results with the next 5-10 years.

SUPPLEMENTARY INFORMATION

The following program descriptions are offered to provide more in-depth information on scientific and technical areas of interest to HEP:
ProgramWebsite: http://science.energy.gov/hep/inp

The mission of the HEP program is to understand how the universe works at its most fundamental level, which is done by discovering the elementary constituents of matter and energy, probing the interactions between them, and exploring the basic nature of space and time. The Intensity Frontier uses intense particle beams and highly sensitive detectors to pursue alternate pathways to investigate fundamental forces and particle interactions by studying events that occur rarely in nature, and to provide precision measurements of these phenomena.

The discovery of neutrino mass and mixing has led to a need for a diverse set of experiments to understand the fundamental nature and interactions of neutrinos.

Scientific topics of interest are:

- How do neutrinos interact with nuclei, including resultant hadron multiplicities, final-state interactions, multi-nucleon effects?
- Are the anomalous appearance results of short-baseline accelerator experiments due to a new, sterile neutrino state?
- What are the values of the mixing parameters, mass differences, and CP violating phase?
- What is the fundamental nature of the neutrino, and what are the values of parameters describing their properties?
- How can we optimize the physics output should a burst of neutrinos from a supernova be detected?
- What are the most interesting new technologies for detecting neutrinos, and what R&D is necessary to develop them fully?